





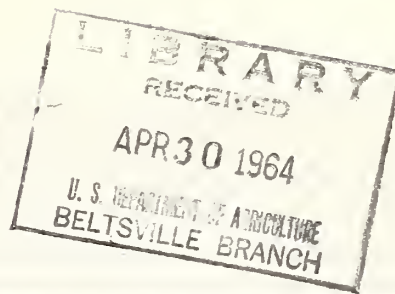


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# **LONG-DISTANCE SHIPMENT OF MARKET MILK**

MARKETING RESEARCH REPORT NO. 648

## PREFACE

Other U.S. Department of Agriculture publications in this general area of study include:

(1) Marketing Research Division, Agricultural Marketing Service. Regulations Affecting the Movement and Merchandising of Milk. A Study of the Impact of Sanitary Requirements, Federal Orders, State Milk Control Laws, and Truck Laws on Price, Supply, and Consumption. Mktg. Res. Rpt. 98, June 1955. (Out of print, may be consulted in libraries.)

(2) Herrmann, Louis F., and Smith, Helen V. Geographic Structure of Milk Prices, 1957-58. AMS-328, July 1959.

(3) Butz, William T. Geographic Structure of Milk Prices, 1960-61. ERS-71, August 1962.

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## SUMMARY

Between September 1, 1960, and August 31, 1961, long-distance shipments of about 424 million pounds of market milk were made, mostly from plants in Iowa, California, Virginia, Wisconsin, and Indiana. The main States receiving these shipments were Texas, Missouri, and Ohio. In addition, much of the long-distance shipment of milk originating in California and Virginia was to markets within the same State. This information was obtained in a survey of over 400 plants handling bulk milk for fluid use. Long-distance shipments were defined to include all movement over 200 miles except regular shipments under the New York-New Jersey and Chicago Federal orders.

Most shipments were made on a regular basis. Only 9 percent were spot shipments to meet emergency needs. Quantities shipped varied considerably from month to month, being largest during the low-production period in the fall and early winter.

Nine haulers of milk operating nearly 200 tanktrucks handled most of the hauling. Less than 10 percent of the shipments were made on trips which included a backhaul. Most haulers attempted to obtain a return approximating 60 cents per loaded mile, with some variation because of size of tanker and other factors.

On the average, hauling rates increased about 16 cents per hundredweight per 100 miles over distances ranging from 355 to 1,444 miles. In tankers transporting 5,000 gallons or more, rates increased 14.9 cents per 100 miles as compared with 16.3 cents per 100 miles for tankers carrying 4,000 gallons. Where backhauls were available, hauling rates were 15 to 20 percent lower.

## LONG-DISTANCE SHIPMENT OF MARKET MILK

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Between the midfifties and the early sixties, the quantities of market milk (milk for fluid use) being moved over long distances declined. For example, bulk shipments of fluid milk from the Chicago milkshed to markets beyond the surplus milk manufacturing area of the Chicago Federal Milk Marketing Order declined from 4.2 million pounds a month during 1955 to 0.5 million pounds a month during 1962. Long-distance shipments increased again in 1963, at least in part due to the widespread drought and consequent shortage of milk supplies in many areas.

A major factor in the declining importance of long-distance shipments during 1955-62 was the general uptrend in marketings of milk, both in the country as a whole and in deficit milk-producing areas. For instance, whole milk sold to plants and dealers by producers in the South Atlantic States increased 25 percent, from an average of 5.9 billion pounds annually during 1955-56 to 7.4 billion pounds annually in 1961-62. In the South Central Region, farm marketings of whole milk increased 23 percent over the same period.

An additional factor contributing to decreased shipments from the Wisconsin-Minnesota region has been the development of other surplus production areas closer to deficit markets, which are able to supply relatively large quantities of market milk. To illustrate, between 1955-56 and 1960-61 sales of whole milk to plants and dealers by Iowa producers more than doubled--from 2.0 billion pounds to 4.2 billion pounds annually. This increase in whole milk sales was achieved despite a decline in total milk production in the State from an average of 6.1 billion pounds annually in 1955-56 to 6.0 billion pounds annually in 1961-62.

To ascertain the geographical pattern of milk shipments and the quantities of bulk fluid milk being moved over long distances, over 400 plants holding certified ratings for interstate milk shipments were contacted in 1961 and 1962. These were practically all of the plants which might make interstate shipments of milk. All shipments exceeding 200 miles were recorded, except that regular shipments to handlers regulated by the Federal orders for New York-New Jersey and Chicago were excluded regardless of the distance the milk was hauled. Both regular and spot (emergency) shipments during the period September 1, 1960, through August 31, 1961, were recorded. Throughout this report, the data on milk shipments are those reported by these plants.

### ORIGIN OF SHIPMENTS

#### North Central Region

In the North Central Region, the leading suppliers of fluid milk to distant markets--markets more than 200 miles away--were Iowa, Wisconsin, and Indiana. Plants in Iowa shipped nearly 87 million pounds of bulk milk to distant markets during the period September 1960 through August 1961 (table 1). Nearly half went to markets in Missouri.

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1/ Dr. Butz was on leave from his position as Professor of Agricultural Economics, Pennsylvania State University, while preparing this report.



Table 1.--Long-distance shipments of milk for fluid use, by State of origin,  
September 1960-August 1961

Region and State	Regular shipments	Spot shipments	Total shipments
	<u>1,000 pounds</u>	<u>1,000 pounds</u>	<u>1,000 pounds</u>
East North Central:			
Ohio.....	106	322	428
Indiana.....	34,458	328	34,786
Illinois.....	1,747	1,105	2,852
Wisconsin.....	25,698	9,483	35,181
West North Central:			
Minnesota.....	25,152	1,413	26,565
Iowa.....	79,966	6,719	86,685
Missouri.....	20,781	2,274	23,055
North Dakota.....	72	---	72
South Dakota.....	907	---	907
Kansas.....	16,414	823	17,237
South Atlantic:			
Virginia.....	44,322	8,096	52,418
West Virginia.....	1,233	---	1,233
North Carolina.....	---	626	626
South Carolina.....	---	77	77
Georgia.....	---	4	4
South Central:			
Kentucky.....	---	98	98
Tennessee.....	1,710	865	2,575
Mississippi.....	16,946	---	16,946
Arkansas.....	8,142	2,748	10,890
Western:			
Colorado.....	---	1,330	1,330
Utah.....	19,616	929	20,545
California.....	89,714	---	89,714
Total.....	386,984	37,240	424,224

Handlers in Texas and Nebraska also purchased relatively large supplies of milk from Iowa on a regular basis.

Shipments were made from Wisconsin to 15 different States in an area extending to Pennsylvania in the east, Florida in the south, and Texas in the southwest. Principal destinations were Illinois markets other than Chicago, and markets in Iowa and Florida.

Bulk shipments from Indiana were made primarily to Ohio markets. A relatively small quantity of Indiana milk was hauled to Florida.

Other important sources of bulk milk in the North Central Region included Minnesota, Missouri, and Kansas. About 40 percent of the market milk shipped from Minnesota was hauled to Iowa, and 25 percent to Texas. Markets in Texas received

70 percent of the shipments from Missouri and 95 percent of the shipments from Kansas.

### Southern Region

Over 80 percent of the Virginia milk that was shipped long distances went to markets within the State. Florida was the major out-of-State market for Virginia shipments. More than 95 percent of the milk shipped from Mississippi went to markets in Alabama. Market milk shipped out of Arkansas was bought chiefly by handlers in Florida and Kentucky markets. Nearly 60 percent of the shipments from Arkansas were sent to Florida.

### Western Region

All long-haul movements originating in California were intrastate shipments. The general pattern of movement was from the Fresno-Hanford area south to Los Angeles and north to San Francisco.

Shipments originating in Utah were moved, for the most part, to Colorado markets. However, about 5 percent of the milk was hauled to New Mexico and Arizona.

## DESTINATIONS OF SHIPMENTS

### North Central Region

Among the North Central States, Missouri and Ohio were the principal destinations of market milk being moved long distances during 1960-61 (table 2). Iowa was the primary source of long-haul bulk milk for markets in Missouri, and Indiana was the source of about 90 percent of the long-haul shipments to Ohio.

Nebraska, Iowa, and Illinois each received about 20 million pounds of market milk from distant sources. Seventy percent of the milk shipped to markets in Nebraska originated in Iowa and nearly 20 percent in Minnesota. Long-distance shipments into Iowa were drawn about equally from Minnesota and Wisconsin. Most of the long-haul milk going to Illinois originated in Wisconsin.

### Southern Region

Markets in Texas and Virginia were the principal destinations of long-haul movements of milk into and within Southern States. Texas received long-distance shipments from seven States, with 85 percent of the supplies originating in Iowa, Missouri, and Kansas. Most of the market milk hauled more than 200 miles in Virginia represented intrastate shipments to markets in eastern Virginia.

Florida markets were supplied with bulk milk by shipments from nine States, the most distant being Minnesota. Arkansas was the most important source, supplying more than a third of the amount shipped. Virginia and Wisconsin together accounted for over 40 percent.

Alabama obtained nearly 17 million pounds of bulk milk for fluid use from distant sources, over 95 percent originating in Wisconsin.

Table 2.--Long-distance shipments of milk for fluid use, by States of destination,  
September 1960-August 1961

Region and State	Regular shipments	Spot shipments	Total shipments
	<u>1,000 pounds</u>	<u>1,000 pounds</u>	<u>1,000 pounds</u>
North Atlantic:			
Pennsylvania.....	---	368	368
East North Central:			
Ohio.....	35,420	1,402	36,822
Indiana.....	1,721	1,069	2,790
Illinois.....	17,604	878	18,482
Michigan.....	---	252	252
West North Central:			
Minnesota.....	2,291	---	2,291
Iowa.....	16,984	2,008	18,992
Missouri.....	44,256	4,542	48,798
Nebraska.....	19,820	1,793	21,613
Kansas.....	---	259	259
South Atlantic:			
Virginia.....	42,780	811	43,591
West Virginia.....	---	249	249
North Carolina.....	---	1,145	1,145
South Carolina.....	---	1,917	1,917
Florida.....	9,422	7,698	17,120
South Central:			
Kentucky.....	3,120	1,369	4,489
Tennessee.....	---	3,614	3,614
Alabama.....	16,464	214	16,678
Mississippi.....	326	441	767
Arkansas.....	1,529	332	1,861
Texas.....	64,384	5,491	69,875
Western:			
Montana.....	72	---	72
Colorado.....	20,523	---	20,523
New Mexico.....	554	1,348	1,902
Arizona.....	---	40	40
California.....	89,714	---	89,714
Total.....	386,984	37,240	424,224

### Western Region

As indicated previously, much of the long-distance hauling among Western States, particularly in California, represented intrastate movements. The major interstate movement of market milk was from Utah to Colorado.



## SEASONALITY OF SHIPMENTS

Seasonal long-distance movements of market milk exhibited a pattern converse to seasonal variations in milk production. During the 12 months covered by the study, the seasonal high in long-distance shipments occurred during the 6-month period September through February, the time of year when milk production is comparatively low. Sixty percent of the 424 million pounds shipped during the 12-month period were hauled during this 6-month interval (table 3). The seasonal low for long-distance shipments occurred during the period of flush milk production in the spring and early summer.

Among the States shipping relatively large quantities of bulk milk to distant markets, there was considerable variation in amounts shipped from month to month. Shipments from Iowa, for instance, ranged from slightly less than 5 million pounds in August to nearly 10 million pounds in February. Long-distance shipments originating in Wisconsin increased from half a million pounds or less during the summer months to approximately 10 million pounds in September. In Indiana, Minnesota, and Arkansas, also, quantities of milk shipped varied widely between seasons. The least seasonal variation occurred in shipments from Kansas, Virginia, Mississippi, Utah, and California.

### LONG-DISTANCE HAULERS OF MARKET MILK

Interstate transportation of fluid milk is exempt from economic regulation by the Interstate Commerce Commission. That is, the Commission does not control the number of firms in the industry, nor designate the routes or areas to be served, nor establish the rates to be charged for given distances. Fluid milk carriers are, however, subject to the same safety regulations as are in effect for haulers of non-exempt commodities in interstate traffic.

During the winter of 1961-62, nine carriers engaged in long-distance hauling of milk were contacted to determine operational practices and rates charged. These firms were responsible for most of the long-distance shipment of market milk. The group included both dairy cooperatives and regular milk-hauling firms. Establishments included in the survey were located mainly in the north central and southwestern sections of the country. Data collected, including rates charged for shipments, referred to operations during the 12-month period ending August 1961.

Size of business, as measured by the number of tank trailers, varied from 4 to 55 tankers. The 9 firms operated a total of 193 tankers. The median number was 20 tankers.

Capacity of individual tankers varied from 3,800 to 5,700 gallons, although 95 percent of the units held over 4,000 gallons, and nearly 50 percent held over 5,000 gallons. Newer vehicles tended to be equipped with larger tanks.

During the period observed, the 9 firms hauled bulk milk to a total of 17 States, including long hauls such as from the Lake States to New York, Florida, and New Mexico. The longest haul was nearly 1,450 miles.

Table 3.--Monthly long-distance shipments of milk for fluid use, by State of origin, September 1960-August 1961

Region and State	1960												1961												Total
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.													
	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.		lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.
East North Central:																									
Ohio.....	---	---	---	106	---	322	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	428
Indiana.....	4,876	4,017	4,161	4,138	4,009	3,041	2,983	2,400	1,837	1,583	787	864		---	---	---	---	---	---	---	---	---	---	---	34,786
Illinois.....	890	516	404	313	318	278	---	---	---	---	133	---		---	---	---	---	---	---	---	---	---	---	---	2,852
Wisconsin.....	9,970	4,136	4,049	2,094	3,238	7,348	1,804	1,007	589	---	566	380		---	---	---	---	---	---	---	---	---	---	---	35,181
West North Central:																									
Minnesota.....	4,135	4,673	3,515	2,602	3,769	3,565	2,055	766	493	232	328	432		---	---	---	---	---	---	---	---	---	---	---	26,565
Iowa.....	5,980	5,767	6,441	7,425	9,330	9,788	8,385	8,281	8,090	6,342	5,909	4,947		---	---	---	---	---	---	---	---	---	---	---	86,685
Missouri.....	3,044	2,937	2,715	2,442	1,358	1,103	1,332	1,384	1,432	1,404	1,562	2,342		---	---	---	---	---	---	---	---	---	---	---	23,055
North Dakota.....	50	22	---	---	---	---	---	---	---	---	---	---	72		---	---	---	---	---	---	---	---	---	---	---
South Dakota.....	---	---	---	---	---	151	129	100	104	125	149	149	907		---	---	---	---	---	---	---	---	---	---	---
Kansas.....	1,691	1,578	1,626	999	1,012	813	924	1,217	1,176	1,502	2,291	2,408	17,237		---	---	---	---	---	---	---	---	---	---	---
South Atlantic:																									
Virginia.....	6,904	5,759	5,072	3,671	4,391	3,781	4,723	3,567	4,471	3,146	3,190	3,743		---	---	---	---	---	---	---	---	---	---	---	52,184
West Virginia.....	---	161	---	---	---	---	---	---	317	409	191	155		---	---	---	---	---	---	---	---	---	---	---	1,233
North Carolina.....	---	55	176	87	76	---	---	---	---	232	---	---	626		---	---	---	---	---	---	---	---	---	---	---
South Carolina.....	---	---	---	---	---	---	---	---	---	---	---	77		---	---	---	---	---	---	---	---	---	---	---	---
Georgia.....	4	---	---	---	---	---	---	---	---	---	---	---	4		---	---	---	---	---	---	---	---	---	---	---
South Central:																									
Kentucky.....	---	98	---	---	---	---	---	---	---	---	---	---	98		---	---	---	---	---	---	---	---	---	---	---
Tennessee.....	573	60	477	465	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---
Mississippi.....	1,372	1,372	1,372	1,372	1,372	1,372	1,372	1,372	1,372	1,372	1,372	1,854		---	---	---	---	---	---	---	---	---	---	---	---
Arkansas.....	1,571	1,531	1,258	853	730	405	71	196	1,040	552	1,047	1,636		---	---	---	---	---	---	---	---	---	---	---	---
Western:																									
Colorado.....	173	159	206	96	270	167	128	23	24	---	63	21		---	---	---	---	---	---	---	---	---	---	---	1,330
Utah.....	1,931	1,984	1,968	1,672	1,839	1,604	1,068	1,018	1,122	1,847	1,931	2,561		---	---	---	---	---	---	---	---	---	---	---	20,545
California.....	9,277	8,893	7,917	8,221	8,269	6,288	6,752	5,532	5,486	6,666	7,153	9,260		---	---	---	---	---	---	---	---	---	---	---	89,714
Total.....	52,441	43,718	41,357	36,556	40,071	40,026	31,726	26,863	27,553	25,412	26,672	31,829	424,224		---	---	---	---	---	---	---	---	---	---	---

## Backhauling: Opportunities and Limitations

Backhauls were infrequent among the carriers observed, involving less than 10 percent of the milk shipments during the 12-month period. Items that carriers backhauled included liquid sugar, wine, molasses, brandy, and liquid cleaning compounds.

Many of the food and other products adapted to tanker transport are nonexempt commodities; that is, authority to haul these commodities in given areas is granted by the Interstate Commerce Commission. Such authorization is granted or denied generally on the basis of need for additional transport facilities. This regulation affects the opportunities of carriers of exempt agricultural commodities to obtain backhauls. While not common among carriers of fluid milk, one way of obtaining a backhaul is to trip-lease. Trip-leasing is the practice of leasing for a single trip--usually a return trip--a rig owned by one hauler to another hauler who is under the economic regulation of the Interstate Commerce Commission.

Local health ordinances also influence the opportunity for backhauling by restricting the commodities that may be hauled in tankers that carry milk to the local milk market.

The greatest limitation in obtaining backhauls, however, is the tanker itself, which tends to restrict the kinds of products that can be transported. In recent years, a number of innovations have been tried in an attempt to haul bulk milk on vehicles not designed specifically for liquid products. For instance, bulk milk has been carried in reusable plastic bags on open flat bed equipment. Another innovation is a conventional type of enclosed semitrailer with suspended belly tanks (fig. 1). Two separate tanks are suspended from the bed of the trailer, each tank holding nearly 2,400 gallons. Tare weight of the tractor and trailer is approximately 34,000 pounds, or about 10,000 pounds more than the weight of a conventional tractor semitrailer. Units of this type can accommodate almost any kind of freight.

## Hauling Charges

Distance is a principal factor determining hauling charges for bulk milk moved long distances. For a given distance, however, charges may vary due to size of load, frequency or regularity of shipments, demand for hauling services, and the opportunity for the hauler to obtain a backhaul.

Charges per loaded mile.--Information supplied by haulers indicates that firms attempted to obtain a return approximating 60 cents per loaded mile. <sup>2/</sup> The weighted average charge for all long-distance shipments observed was 60.3 cents per loaded mile. Charges varied from 50.1 cents to 82.7 cents per loaded mile.

On shipments in tankers of 4,000-gallon capacity, charges per loaded mile averaged 58.6 cents. In larger tankers, with capacities ranging up to 5,100 gallons, charges averaged 67.2 cents per loaded mile. The higher charges for larger equipment reflected the higher fixed and operating costs incurred in the use of larger tankers.

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<sup>2/</sup> Charge per loaded mile is the total charge for the shipment divided by one-way distance. Haulers often determine the charge per hundredweight for a stated destination by inserting in this formula an established charge per loaded mile for a given size of tanker.





Figure 1.--Three views of a specially-built truck with dry cargo space above (top picture) and milk tanks below.



